

THE WEIZMANN SCIENCE PRESS OF ISRAEL

National Council for Research and Development

ISRAEL Journal of BOTANY

Volume 27 1978



מוסד ויצמן לפרסומים במדעי הטבע ובטכנולוגיה, ירושלים THE WEIZMANN SCIENCE PRESS OF ISRAEL

Publishers of the following journals

ISRAEL JOURNAL OF BOTANY; ISRAEL JOURNAL OF CHEMISTRY;
ISRAEL JOURNAL OF EARTH-SCIENCES; ISRAEL JOURNAL OF MATHEMATICS;
ISRAEL JOURNAL OF TECHNOLOGY; ISRAEL JOURNAL OF ZOOLOGY;
JOURNAL D'ANALYSE MATHEMATIQUE

(Science for Youth) לרעת מדע לנוער המתבגר ארע עתון מדעי לכל (Science) בידע עתון מדעי לכל

Supporting Institutions

THE NATIONAL COUNCIL FOR RESEARCH AND DEVELOPMENT;
BAR-ILAN UNIVERSITY; BEN GURION UNIVERSITY OF THE NEGEV;
TECHNION—ISRAEL INSTITUTE OF TECHNOLOGY; TEL AVIV UNIVERSITY;
THE HEBREW UNIVERSITY OF JERUSALEM; THE WEIZMANN INSTITUTE OF SCIENCE

GENERAL EDITORIAL BOARD

ISRAEL JOURNAL OF BOTANY

D. ABIR Formerly Bulletin of the Research I. ARNON Council of Israel, Section D M. CARMELI A. DVORETZKY **Editorial Board** H. EYAL-GILADI M. NEGBI Editor-in-Chief H. HANANI D. ATSMON M. JAMMER B. L. EPEL J. JORTNER MARGALIT GALUN L. REINHOLD CHAIA C. HEYN N. SHARON M. LITAV Y. WEILER I. NOY-MEIR J. PALTI LEONORA REINHOLD **Executive Editor** T. SACHS L. LESTER M. TAL

Subscriptions are to be addressed to the Weizmann Science Press of Israel, P.O.B. 801, Jerusalem 91000, Israel. Subscription fees per volume, \$25.00. + \$2.50 postage & handling.

Copyright © 1979 by THE WEIZMANN SCIENCE PRESS OF ISRAEL Mercaz Press, Jerusalem

ISRAEL JOURNAL OF BOTANY VOLUME 27, 1978 TABLE OF CONTENTS

Number 1

The diatoms of the hyperhaline solar lake (NE Sinai) A. Ehrlich	1
TAXONOMY	
A new species of <i>Onosma</i> (Boraginaceae) from eastern Turkey J. R. Edmondson	14
Pezizales of Israel. VI. Addition to Humariaceae Z. Avizohar-Hershenzon and H. Nemlich	18
Ascotricha bosei var. verruculata var. nov. A. Subrahmanyam	23
BOOK REVIEWS	27
SCIENTIFIC MEETINGS Abstracts of papers presented at the meeting of the Botanical Society of Israel, 1978	30
Number 2	
PHYSIOLOGY A control of stomata maturation in Aeonium T. Sachs and P. Benouaiche	47
A possible role of malate dehydrogenase activity in seedling development of cotton (Gossypium hirsutum) M. Perl	54
A new report of environmental parthenocarpy in Solanaceae S. Baksh, A. Jamal and M. Iqbal	62
ECOLOGY Species diversity of semishrub xerohalophyte communities in the Judean desert of Israel A. Danin	66
PLANT BIOLOGY Morpho-ecological studies of Arisarum vulgate TargTozz. J. Galil	77
TAXONOMY AND FLORISTICS Two new allium species from Turkey M. Koyuncu and F. Kollman	90
Solanum nigrum L, and S. luteum Miller in the flora of Israel R. Karschon, C. Grunwald and A. Weinstein	94
BOOK REVIEWS	97

Numbers 3-4

REVIEW	
Physiological concepts of the association between parasitic angiosperms and their hosts –	
a review Y. Tsivion	103
DIFFERENTIATION	
Host tissue determination of xylem formation in the haustorium of Cuscuta Y. Tsivion	122
Cytoplasmic reorientation: an early stage of vascular differentiation	
H. Kirschner and T. Sachs	131
11. Kusciner and 1. Sacis	131
The use of the brightener "Calcofluor White M2R New" in the study of fungal growth	
G. Kritzman, I Chet, Y. Henis and A. Hüttermann	138
GERMINATION	
Variability in <i>Prosopis farcta</i> in Israel: seed germination as affected by temperature and	
salinity A. Dafni and M. Negbi	147
TAXONOMY AND GEOBOTANY	
The vegetation of the Hazeva area, Israel Dvora Rudlich and Avinoam Danin	160
The vegetation of the mazeva area, israel Drota Ruduch and Armoum Danin	100
Cytogeography and taxonomy of the <i>Portulaca oleracea</i> L. polyploid complex	
Avinoam Danin, Irene Baker and Herbert G. Baker	177
CYTOLOGY	
Meiotic chromosome number in Cladophora callicoma Kuetzing B. R. Chaudhary	212
BOOK REVIEWS	217
DOOK REVIEWS	217

AUTHOR INDEX

A. Altman, 36, 37, 38, 40 Z. Avizohar-Hershenzon, 18	B. R. Chaudhary, 212 I. Chet, 29, 138	J. Friedman, 43 R. Friedman, 36
H. G. Baker, 177 I. Baker, 177 S. Baksh, 62 D. Y. Ben-Gad, 40 J. Ben-Ja'acov, 36 P. Benouaiche, 47 T. Berman, 217	A. Danin, 66, 160, 177 A. Dafni, 147 B. Dublin, 39 R. Dulberger, 31, 224 M. Edelman, 39	J. Galil, 77 A. W. Galston, 38 S. Gazit, 34 E. E. Goldschmidt, 40 R. Goren, 40, 42 M. Grasani, 41
N. Binyamini, 98	J. R. Edmonson, 14	J. Gressel, 42, 45
B. A. Bravdo, 39	A. Ehrlich, 1	C. Grunwald, 94
H. E. Brisker, 40	A. Eshel, 33	A. Gur, 33

A. Hagiladi, 36 H. Hardt, 38 E. Harel, 99 I. Harif, 44 Y. Henis, 138 J. Hepner, 33 C. C. Heyn, 27, 30, 217, 218

A. Hüttermann, 138

M. Iqbal, 62

B. Jacoby, 34 K. M. Jakob. 39 A. Jamal, 62 D. M. Joel, 44

A. Kadman, 34 R. Karschon, 94 R. Kaur-Sawhney, 38 N. Kedar, 46 H. Kirschner, 131 M. Kislev, 45

B. Kok, 38 D. Koller, 219 F. Kollman, 90 E. Kopeliovitch, 46 M. Koyuncu, 90

G. Kritzman, 138

Aaronsonhnia, 167, 175

D. Levy, 35 H. Lips, 41 S. Lurie, 39

A. M. Mayer, 28 Y. Mizrahi, 35, 46 S. P. Monselise, 40, 41

G. Natanson, 36 M. Negbi, 32, 147 H. Nemlich, 18

Y. Okon, 27, 97, 221

R. Ornduff, 31

J. Palti, 100 N. Paz, 39 M. Perl, 44, 54 U. Plitmann, 30 E. Pressman, 32

D. Rabinowitch, 46 A. Reisfeld, 39 D. Rosen, 220 D. Rudlich, 160

M. Sachs, 32 T. Sachs, 41, 47, 131 G. Sapir, 31 L. A. Segel, 45 N. Seligman, 222 A. Shemy, 41 Y. Shulman, 33 Z. Stein, 43 A. Subrahmanyam, 23

Y. Tsivion, 37, 101, 103, 122, 219

Y. Waisel, 33 A. Weinstein, 94 E. Werker, 45 J. Wurzburger, 42

E. Zamski, 32, 36 O. Ze'evi, 32 M. Zera, 97 S. Zilkah, 42 G. Ziv, 34 A. Zur, 42

SUBJECT INDEX

abscisic acid, citrus peel, 40 abscission, leaf, Citrus, 42 calyx, Citrus, 42 NAA, 42 Acacia, 160 ff Acacia raddiana-Tamarix nilotica association, 169 Acacia tortilis-Anabasis articulata association, 168 Aellenia, Judean desert, 68-76 AELUROPETUM LITTORALIS, 160 ff Aeluropus, 160 ff Aeonium, stomata maturation, 47-53 Alectra, 113 Alhagi, 171 Allium cepa, 123 ff nevsehirense sp. nov., 90-93 karamanoglui sp. nov., 90-93

Amphora, Solar Lake, 1-13 ANABASIDETUM ARTICULATAE, 160 ff Anabasis, Hazeva area, 160 ff Judean desert, 71-76 Anabasis articulata-Acacia tortilis association, 166-167 Anabasis articulata-Gymnocarpus decander association, 168 Anabasis articulata-Zygophyllum dumosum-Reaumuria hirtella sequence, 171 Anabasis hierochuntica-Trigonella stellata association, 169 Anabasis, Judean desert, 71-76 Anastatica, seed, dispersal, 43 germination, 43-44 regeneration, 43 Apium, Hazeva area, 171 vernalization, 32-33 apple, uptake of minerals, 33-34

Arceuthobium, 104
Arisarum, morphoecology, 77-89
Ascotricha bosei var. verruculata var. nov., 23-26
Asterisus, 172
Atractylis, 169
Atriplex, Hazeva area, 168 ff
recycled salt belt, 73
auxin, haustorium development, 114
induced translocation, 111-112

Balanites, 168 blue light, effect on ivy, 32 Botrytis, 138, 142 bundle sheath, spinach, 38

C₄ pathway, 205 calcofluor white, fungal growth, 138-146 Calligonum, 169 Calligonum comosum-Hammada salicornica sequence, 168-169 Calycotome, seed, fire effect, 44 carbohydrates, accumulation, parasites, 109-110 translocation, parasites, 108-112 utilization, parasites, 108-112 carbon dioxide, assimilation, in parasite, 104 evolution, tomato, 46 fixation, stomata, 39 Castilleja, 104 Cenchrus, 167 Centaurea, 170 Centranthus, 123 ff Chenolea, Judean desert, 68-76 chloroplasts, Citrus peel, 40 spinach, 38 Spirodela, protein synthesis, 39 chromosomes, Cladophora, 212-216 Portulaca, 177-211 Citrus, abscission, leaf explant, 42 calyx, 42 2.4-D.42 ethylene induced ABA formation, 40 growth regulation, 41 gibberellic acid, 40 SADH, 40 sodium dikegulac, 41 starch content, 40 vegetative development, 40 Cladophora, meiosis 212-216 climate, Hazeva area, 165 Cocculus, 168 Colchicum, contracting roots, 82-83 Coleus, 113, 123 ff

Comandra, 116
contracting roots, Arisarum, 79-89
cotton, malate dehydrogenase, 54-61
seed germination, 44
seedling establishment, 44, 54-61
Crotalaria, 167
Cuscuta, host parasite association, 104 ff, 122-130
hypersensitivity, 37
infection, 37
xylem formation, 122-130
cytokinins, role in haustorial development, 123
sink induction, 109, 111
Cytoplasmic reorientation, 131-137
Cyanella, 31-32

date palm, 171
determination of xylem formation, 122-130
diatoms, Solar Lake, Sinai, 1-13
2,4, dichlorophenoxyacetic acid, abscission, 42
differentiation, xylem, 122-130, 131-137
dimorphism, Cyanella, 31-32
Diplotaxis, 172
distribution, Portulaca, 208-209

Echiochilon, 170
ecology, Portulaca, 202-207
enzyme, activity, host—parasite interface,
112-113, 116-117
Epipactis, 171
ethylene, evolution, tomato, 46
induced ABA formation, 40

floral dimorphism, 31-32 fluorescent dye, fungal growth, 138-146 *Fomes*, staining, growth, 139, 143

geomorphology, Hazeva area, 163 geophytes, Hazeva area, 170 germination, Anastatica, 43-44 fire effect in maquis, 44 Prosopis, 147-159 salinity, 147-159 temperature effect, 147-159 gibberellins, bolting and flowering, 32-33 haustorial development, 123 ff sweet lime, 40 Gladiolus, contracting root, 86 Gossypium, malate dehydrogenase, 54-61 grafting vs. parasitism, 114-115 growth, fungi, 138-146 hypocotyl, 147-159 radicle, 147-159

guard cell, CO₂ fixation, 39 Gymnocarpos decander—Helianthemum lippi association, 171

habitat, Portulaca, 205-207
Halogeton, Judean desert, 68-76
HALOXYLETUM PERSICI, 160 ff
HALOXYLETUM SALICORNICAE, 160 ff
Haloxylon persicum—Hammada salicornica
association, 170

Haloxylon persicum—Hammada salicornica sequence, 169-170

Hammada, Hazeva area, 160 ff Judean desert, 71-76

Hammada salicornica—Acacia raddiana association, 171

Hammada salicornica—Acacia raddiana sequence, 168-169

Hammada salicornica—Calligonum comosum association, 169

Hammada salicornica—Haloxylon persicum sequence, 170

Hammada salicornica—Moltkiopsis ciliata association, 170

Hammada salicornica—Orhradenus baccatus association, 169

Hammada salicornica—Salsola cyclophylla association, 169

Haplophyllum, 167

haustorium, 103-121, 122-130

heat tolerance, potato, 35

Hedera, blue light effect, 32 HELIANTHEMETUM LIPPII, 169

Helianthemum lippii—Salvia aegyptica association, 168

herbicides, genetic resistance, 45-46

Hordeum, sodium avoidance, 34

polyamines, 38

host parasite association, 103-121, 122-130

Humariaceae, Israel, 18-22 *Hyoscyamus*, 171

hypocotyl growth, salinity, 147-159

indole acetic acid, cytoplasmic reorientation, 131-137 haustorial development, 123 ff rooting, 36 transport, 36 xylem formation, 122-137

JUNCETUM ARABICI, 160 ff Juncus, 160 ff

Kickxia, 170

Lasiurus, 170
Lathraea, 113, 115, 116, 117
Lavandula, 169 ff
Leopoldia, contracting roots, 86
Limonium, 171
Lotus, 170
Lupinus, New and Old World, 30-31
Lycium, 168

maleic hydrazide, 123 ff malic dehydrogenase, cotton seed, 44 mango, Mediterranean fruit fly, 44-45 rootstock, 34 secretory ducts in fruit, 44-45 mannitol, accumulation, parasites, 109-110 Medicago, 123 ff Mediterranean fruit fly, 44-45 meiosis, Cladophora, 212-216 Mesembryanthemum, Judean desert, 72-76 mesophyll, spinach, 38 minerals, leaf tissue, Suaeda, 33 uptake, apple, 33 Moltkiopsis, 169 Monsonia, 169 Monricandia, 170 morphogenesis, haustorium, 114-117 mucilage, root, Sorghum, 45

naphthaleneacetic acid, abscission, Citrus, 42
Navicula, 1-13
N. dvorachekii nov. sp., 2-3
N. massadaea nov. sp., 6-8
Nerium, spray damages, 36
Nicotiana, CO₂ fixation in stomata, 39
leaf age, 39
photorespiration, 39
photosynthesis, 39
Nitraria, 172, 173
Nitzschia, Solar Lake, 1-13
nodal ordination, Hazeva vegetation, 173

oak, seed, fire effect, 44
Odontites, 107, 108
Onosma anisocalyx sp. nov. 14-16
Orobanche, 106 ff, 128
Orthocarpus, 115
osmotic interference, 70-76

Pancratium, 205
parasitism, 103-121
parthenocarpy, Solanaceae, 62-65
Pennisetum, 168
Pentatropis, 169
Pezizales, Israel, 18-22

SADH, sweet lime, 40 Phagnalon, 171 Phaseolus, hormones, 41 salinity, germination, 147-159 Judean desert, 66-76 metabolism, 41 profiles, Hazeva area, 163-165 root, apex, 41 root, formation, 36 seedling development, 147-159 shoot apex, 41 Salsola, 170 sodium avoidance, 34 Judean desert, 67-76 transport of IAA, 36 Salsola cyclophylla-Anabasis articulata phloem, translocation, parasites, 108-112 association, 169 Phoenix dactylifera-Juncus arabicus salt tolerance, Prosopis, 157-158 association, 172 SALVIETUM TRILOBAE, 88 Phoenix dactilifera-Juncus arabicus sequence, Sarcopoterium, seed, fire effect, 44 172-173 Saxaul, 171 Phoradendron, 104 Sclerotium, growth, 138-146 photoperiodism, celery, 32-33 secretory ducts, mango fruit, 44-45 PHRAGMITETUM COMMUNIS, 160 ff seed, dispersal, Anastatica, 43 Phragmitis, 160 ff floating in sea water, 202-205 Phtirusa, 113 germination, Anastatica, 43-44 phylogeny, Portulaca, 207-208 fire effect, 44 Portulaca, 202-205 Pistacia, seed, fire effect, 44 Prosopis, 147-159 Pisum, 131-137 Poa, Judean desert, 72-76 production, soybean, 108 structure, Portulaca, 177-211 Polycarpaea, 170 senescence, polyamines retardation, 37 polyamines, retardation of senescence, 37 Shamouti orange, ABA in peel, 40 ribonuclease activity, 38 Sepultaria, 18-22 Portulaca oleracea, cytogeography, taxonomy, Simmondsia, floral bud dormancy, 35 subsp. africana subsp. nov., 187-189 water regime, 35 sodium, avoidance, 34 subsp. granulato stellulata stat. nov., 189 subsp. impolita subsp. nov., 195-196 sodium dikegulac, citrus growth, 41 nicaraguensis subsp. nov., 186-187 soil, temperature, 33 soils, Hazeva area, 163-165 nitida subsp. nov., 194-195 Solanum, environmental parthenocarpy, 62-65 oleracea, 196-197 Israel, 94-96 papillato-stellulata subsp. nov., 200 subsp. sativa, 201 heat tolerance, 35 Solar Lake, diatoms, 1-13 subsp. stellata subsp. nov., 198-199 subsp. tuberculata subsp. nov., 194 Sorghum, root mucilage, 45 Prosopis, Hazeva area, 171 sour orange, sodium dikegulac, 41 seed germination, 147-159 soybean, achlorophyllous mutant, 108 protoplasts, RNAase, 38 species diversity, Judean desert, 66-76 psammophytes, 170 ff spinach, electron transport, 38 Spirodela, protein synthesis, chloroplasts, 39 radical growth, salinity, 147-159 Stipagrostis, 167-169 Reaumuria, Hazeva area, 171 stomata, CO, fixation, 39 Judean desert, 68-76 maturation, Aeonium, 47-53 Reseda, 171 Striga, 104 Rhinanthus, 104, 106, 107, 115 Suaeda, Hazeva area, 171 rhizome, Arisarum, 79-89 Judean desert, 67-76 RNAase, leaf protoplasts, 38 minerals in leaves, 33 root, contracting, Arisarum, 78-89 sweet lime, vegetative development, 40 Colchicum, 82-83 Gladiolus, 86 Tamarix, 160 ff Leopoldia, 86 taxonomy, Portulaca, 177-211 formation, IAA, 36 temperature, seed germination, 147-159

Tetrapogon, 170

mucilage, Sorghum, 45

tobacco, CO₂ fixation in stomata, 39 leaf age, 39 photorespiration, 39 photosynthesis, 39 tomato, alcobacca, nonripening mutant, 46 CO₂ and ethylene evolution, 46 salinity and ripening, 35 Traganum, 169 translocation, assimilates, parasites, 108-112 xylem, parasites, 106-108 transpiration, host vs. parasite, 106-108 transport, host parasite, 109 ff Trigonella stellata—Notoceras bicorne association, 167 Typha, 171

vascular tissue, differentiation, 122-130, 131-137 vegetation, Hazeva area, 160-176 Judean desert, 67-68 Shephela, 31 vernalization, celery, 32-33 Vicia, sodium avoidance, 34 Viscum, 105, 106

weeds, genetic resistance to herbicides, 45-46 Portulaca, 208-209 wound, induction of vascular differentiation, 131-137

xerohalophyte, communities, 66-76 xylem, formation, 122-130, 131-137 host parasite connection, 116, 122-130 translocation, parasite, 106-108 xylogenesis, see xylem formation

Zea, sodium avoidance, 34
Zilla, 167 ff
Ziziphus, 168, 171
zonation method of vegetation analysis, 160 ff
Zygophyllum, 168 ff
Zygophyllum dumosum—Anabasis articulata
association, 170
Zygophyllum dumosum—Anabasis articulata—
Reaumuria hirtella association, 173
Zygophyllum dumosum—Nitraria refusa
association, 172
Zygophyllum dumosum—Salvia aegyptiaca
association, 169